The MC13-441Ex0-T is a four-channel switching amplifier with intrinsically safe input circuits. Each channel has one non-polarised transistor output with thermally activated short-circuit protection.

The inputs are monitored for short-circuit and wire-break conditions. The monitoring feature can be disabled via a programming jumper on the card. Each channel has a programming jumper block to select the output mode.

Position A selects the direct mode (N.O.). Position R selects the inverse mode (N.C.).

The unit can also be used as a three channel device with a separate common alarm output. To activate the alarm, move both channel 4 jumper blocks to the terminals labelled Su.

Output 4 will be energised (transistor) when inputs 1-3 are under normal operating condition. Output 4 (the alarm) will de-energise when a fault occurs in any input circuit (transistor de-energised, green LED off).

- Intrinsically safe input circuits [EEx ia] IIIC
- Galvanic isolation between input circuit, output circuit and supply voltage
- Input circuit monitoring for wire-break and short-circuit (can be disabled)
- Four short-circuit protected, isolated, non-polarised transistor outputs
- Overvoltage protection
- Suitable for optional use as a 3-channel version with common alarm output
Switching Amplifiers

<table>
<thead>
<tr>
<th>Type</th>
<th>Ident-No.</th>
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<tbody>
<tr>
<td>MC13-441Ex0-T/24VDC</td>
<td>90 252</td>
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</tbody>
</table>

**Supply Voltage** $U_B$
- 20.4...27.6 VDC

**Ripple $W_{pp}$**
- $\leq 10\%$

**Overvoltage release**
- 33 V $\pm 1.5$ V

**Reverse polarity protection**
- 250 V

**Power/Current consumption**
- $\leq 100$ mA

**Galvanic isolation**
- between input circuit, output circuit and supply voltage for 250 $V_{ins}$, test voltage 2.5 $kV_{rms}$

**Input Circuits**
- DIN 19234 (NAMUR), intrinsically safe per DIN EN 50020
- Operating characteristics
  - Voltage: 8 V
  - Current: 8 mA
- Switching threshold: 1.55 mA
- Hysteresis: 0.2 mA
- Wire-break threshold: $\leq 0.1$ mA
- Short-circuit threshold: $\geq 6$ mA

**Programming:**
- The input functions are programmed via jumper blocks on the card.

**Output Circuits**
- four potential-free transistor outputs, short-circuit protected, non-polarised
- Switching voltage: $\leq 30$ VDC
- Switching current: $\leq 200$ mA
- Switching capacity: ca. 4 V/200 mA and approx. 2.7 V/50 mA
- Switching frequency: $\leq 1$ kHz (3 kHz version available)

**Ex-Approval acc. to Certification of Conformity**
- PTB No. Ex-84/2110X
- Maximum nominal values
  - No load voltage $U_0$: 9.6 V
  - Short-circuit current $I_k$: 42.3 mA
- Maximum external inductances/capacitances
  - $[EEx\ ia]IIC$: 1 mH/720 nF (alternatively: 5 mH/560 nF)
  - $[EEx\ ib]IIC$: 19 mH/4 $\mu$F

**LED Indications**
- Power "ON": green (off in alarm condition)
- Status indication: yellow
- Fault: with common alarm monitoring

- If the common alarm monitoring feature is used, the yellow LED of the fourth channel is de-energised during fault.

**Eurocard**
- 100 x 160 mm (DIN 41494)
- Material: glass-fiber reinforced epoxy resin, quality class FR4
- Front panel: plastic, 4TE = 20.32 mm
- individually interlocking
- Connection: connector per DIN 41612, type F, 32-pole (series z+d) or 48-pole
- Operating temperature: -25... +60 °C

**Coding No. 17**

```
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32
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